CLAIMS

1. A sorbent suitable for use as a stationary phase in elution chromatography, the core of said sorbent consisting of an organic resin and said sorbent having a plurality of covalently bonded non-aromatic zwitterionic groups on its surface.

2. A sorbent according to claim 1, **characterised** in that the sorbent comprises a porous carrier.

3. A sorbent according to claim 1 or claim 2, **characterised** in that the zwitterionic non-aromatic groups have been bound to the carrier by polymerising, preferably graft polymerising, monomers comprising non-aromatic zwitterionic groups on the surface of the carrier.

4. A sorbent according to claim 3, **characterised** in that the zwitterionic non-aromatic groups have been incorporated throughout the structure of the carrier sorbent by polymerising monomers comprising non-aromatic zwitterionic groups together with suitable divinyl crosslinking monomers.

5. A sorbent according to claim 1 or claim 2, **characterised** in that the zwitterionic non-aromatic groups have been bound to the carrier by activation of the carrier with an alkylating functional group, which is subsequently reacted with an ω-dialkylaminoalkylsulfonic acid to form non-aromatic zwitterionic groups on the carrier.

6. A sorbent carrier according to claim 1 or claim 2, **characterised** in that the surface of the organic resin has been activated by incorporation of a reactive functional group such as epoxy, or halogenoalkyl, such as choroalkyl or bromoalkyl and that is capable of alkylating the amino group of an

aminoalkylsulfonic acid in a reaction producing covalently bonded zwitterionic non-aromatic groups on the sorbent carrier.

7. A sorbent carrier according to claim 1 or claim 2, **characterised** in that the surface of the organic resin has been activated by incorporation of a reactive functional group such as hydroxyalkyl, carboxylic acid, carboxylic acid chloride, carboxylic acid bromide, carboxylic anhydride, carboxylic ester, alkyl oxonium, epoxy, chloroalkyl, bromoalkyl, diazoalkyl, or activated amide such as a carboxylic imidazolide or triazolide, that is capable of forming an ester or ether bond with a hydroxyl group residing on the alkyl chain interconnecting the quarternary ammonium group and the sulfonate group in a sulfobetaine zwitterion, thus covalently binding a non-aromatic zwitterionic group to the surface of the activated sorbent carrier in a lateral fashion.

8. A sorbent carrier according to any one of the previous claims, **characterised** in that the carrier is a polymeric monolith.

9. A sorbent carrier according to any one of the previous claims, **characterised** in that the zwitterionic groups are ω-sulfoalkyl-trialkylammonio (sulfobetaine) groups.

10. A method for purifying a particular biological macromolecule such as a protein or a nucleic acid by zwitterionic ion exchange chromatography, comprising the steps of

a) determining the appoximative net charge of the biological macromolecule in aqueous solution as a function of pH of said solution;

b) using the information obtained in step a) for choosing a pH and an ionic strength at which the macromolecule obtains a suitably strong interaction with a zwitterionic ion exchange column;

c) using the information obtained in step b) for choosing a pH and an ionic strength at which the macromolecule is eluted;

d) applying a solution containing said biological macromolecule to a column comprising zwitterionic sorbent carriers, said solution having a pH and an ionic strength that have been chosen in step b);

e) eluting the column in step d) with an elution solution whose pH and ionic strength have been chosen in step c); and

f) recovering said biological macromolecule.

11. A method according to claim 10, **characterised** in that the column contains sorbent carriers comprising zwitterionic non-aromatic groups according to anyone of claims 1-9.

12. A method according to claim 10 or claim 11, **characterised** in that the maximal ionic strength used is 0.25 M.

13. A method according to anyone of claims 10-12, characterised in that the solvent in the elution solution consists of water with less than 10% admixture of an organic solvent.

14. An ion exchange column suitable for use in zwitterionic ion exchange chromatography comprising a sorbent carrier according to anyone of claims 1-9.

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